(No Model.) 2 Sheets—Sheet 1.

A. ROBERT.

LOCOMOTIVE.

No. 600,174. Patented Mar. 8, 1898.

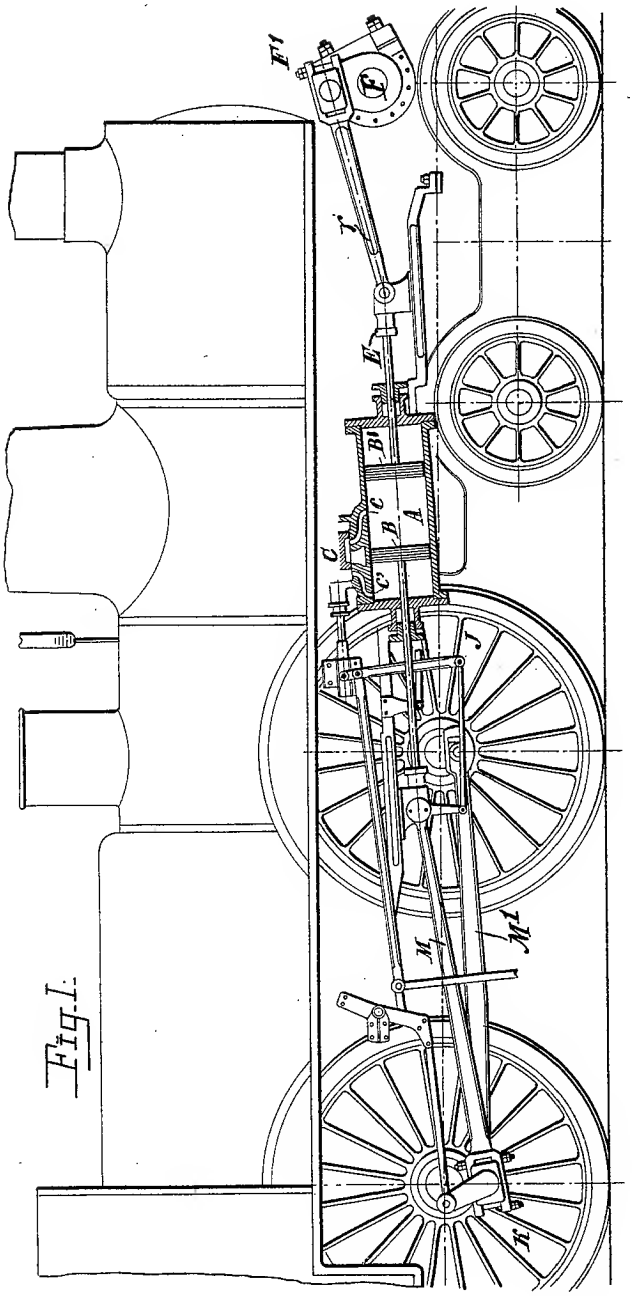

Fig. I.

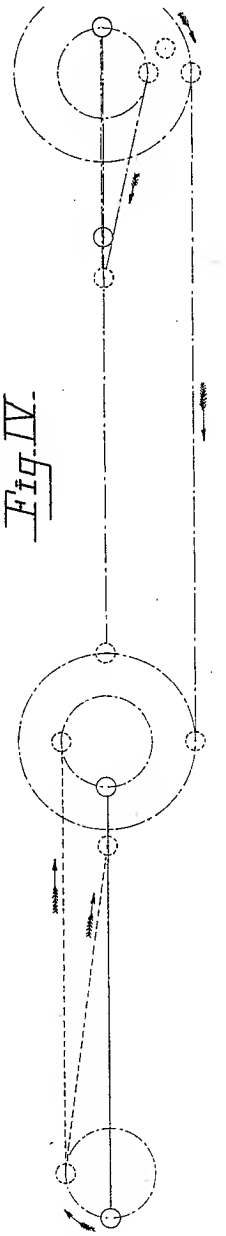

Fig. IV.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. II.

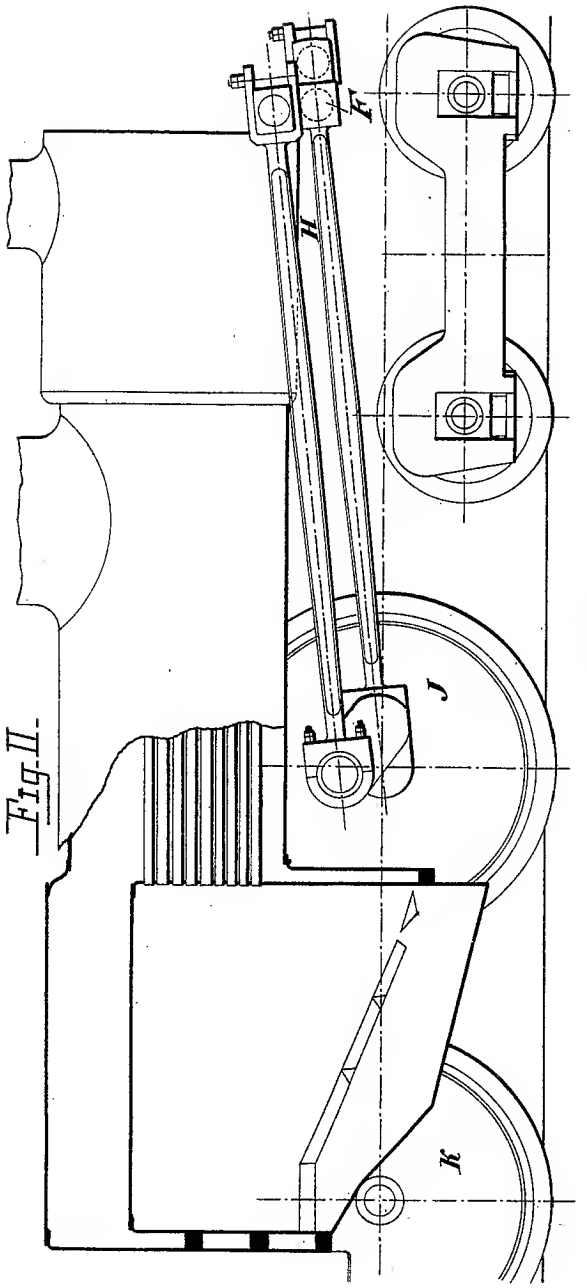
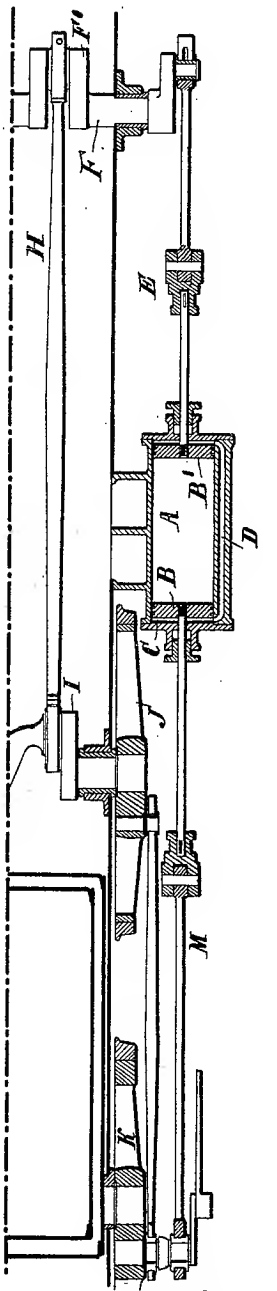


Fig. III.



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UNITED STATES PATENT OFFICE.

AIMÉ ROBERT, OF GILLY, BELGIUM.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 600,174, dated March 8, 1898.

Application filed May 27, 1897. Serial No. 638,389. (No model.) Patented in Belgium April 13, 1897, No. 127,591.

To all whom it may concern:

Be it known that I, AIMÉ ROBERT, a citizen of the Kingdom of Belgium, residing at Gilly, Belgium, have invented certain new and useful Improvements in Locomotives and other Steam-Engines, (for which Letters Patent have been granted in Belgium, No. 127,591, dated April 13, 1897;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has relation to steam and like motive-power engines; and it consists, essentially, in the application of the power through the medium of two pistons working in one and the same cylinder in opposite directions and suitable connections connecting said pistons independently of each other to the driven element.

The invention further consists in the combination, with a twin-piston cylinder, of a simple distributing-valve, as will hereinafter be more fully set forth.

By means of the described arrangement I am enabled to drive both trains of drivers of a locomotive, for instance, directly by the connecting-rods and also to materially reduce the interior diameter of the cylinders and the throw of the piston in view of the fact that the motive fluid acts in an ordinary single-cylinder double-acting engine upon two pistons and in the case of a locomotive upon four, so that two of the cylinders in the case of locomotives provided with four may be dispensed with, while a quadruple action is obtained in the case of a single-cylinder double-acting engine.

In the accompanying drawings I have illustrated my invention in its application to locomotive-engines as an example.

Figure I is a side elevation of so much of a locomotive as will be necessary to illustrate the invention, the near cylinder being shown in section. Fig. II is a like view, partly in longitudinal vertical section. Fig. III is a partial horizontal section, and Fig IV a diagram of connections.

A indicates the cylinder, B B′ the two pistons therein, and C the distributing-valve, having two steam-passages *c c′* communicating with the cylinder about midway of its length and at its rear end, respectively.

The rod of piston B is, as usual, connected to a cross-head, to which is also connected one end of a connecting-rod M, whose opposite end is connected, as usual, with one of the rear drive-wheels K, a second connecting-rod M′ connecting said rear wheel K with the corresponding forward drive-wheel J. The rod of piston B′ is connected through the medium of a cross-head E and connecting-rod *r* with a crank F′ on a crank-shaft F at the forward end of the locomotive, said shaft being also connected through a rod H with a crank on the axle of one of the forward drive-wheels J. The distributing-valve C is constructed and operated in the usual manner; but in order to admit steam simultaneously to both ends of the cylinder the latter is provided with a longitudinal passage D, Fig. III, so that when steam-passage *c′* is in communication with the steam-supply such steam will flow to both ends of the cylinder A, thereby avoiding a complex steam distribution.

Of course it will be understood that the parts described are duplicated, there being one cylinder and connections at each side of the locomotive. As will be readily understood, the steam acts alternately upon the opposite faces of the two pistons B B′ in such manner as to cause them to move reciprocally or toward and from each other. The power of the piston B′ is transmitted through shaft F and rods H to drivers J and through rods M′ to drivers K, and the power of piston B is transmitted through rods M to drivers K and through rods H to drivers J, so that both trains of drivers are subjected to the same power impulses, while the moving parts are equilibrated, or substantially so, thus avoiding injurious vibrations and admitting of the starting of the locomotive without shock and sliding of the drivers.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

In a locomotive-engine, the combination with the forward and rear drivers and the outside power-cylinders each provided with reciprocally-movable pistons; of outside cross-

heads and connecting-rods connecting one of the pistons of each cylinder with the rear drivers, and a crank-shaft F at the forward end of the locomotive, outside cross-heads and connecting-rods connecting the other pistons with said crank-shaft F, inside connecting-rods connecting the latter shaft with cranks on the axle for the forward drivers, and outside connecting-rods connected to cranks on both drivers, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

AIMÉ ROBERT.

Witnesses:
N. ARITOVY,
EDOUARD LOHANN.